

Appl. No.: 10/647,815
Amendment Dated: December 20, 2004
Reply to Office Action of September 21, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

Listing of the Claims:

1. **(Currently Amended)** a burner apparatus comprising:
 - a housing defining a chamber and having an air inlet;
 - a peripherally extending baffle disposed in said housing, a first peripherally extending flow passage being formed between said housing and said baffle, said first flow passage being in open communication with said air inlet;
 - a peripherally extending combustion liner disposed inwardly of said baffle, a second peripherally extending flow passage being formed between said liner and said baffle, said second flow passage being in open communication with said first passage;
 - a reversing diverter disposed in said chamber, said diverter being positioned to direct air flowing from said first flow passage into said second flow passage;
 - a burner assembly mounting plate disposed in said liner, said burner mounting plate having a first side and a second side, said mounting plate and said liner at least partially defining a burner barrel on the first side of said mounting plate there being at least one liner perforation through said liner providing open communication between said second flow passage and said burner barrel;
 - at least one burner assembly mounted on said burner mounting plate; and

a plenum on the second side of said mounting plate, and being in open communication with said second flow passage.

2. **(Original)** The burner apparatus of Claim 1 wherein said baffle has at least one baffle perforation through said baffle providing open communication between said first flow passage and said second flow passage.

3. **(Original)** The burner apparatus of Claim 2 wherein there are a plurality of said baffle perforations.

4. **(Cancelled)**

5. **(Currently Amended)** The burner apparatus of Claim 14 wherein there are a plurality of said liner perforations.

6. **(Original)** The burner apparatus of Claim 1 wherein there are a plurality of peripherally disposed louvers providing open communication between said first flow passage and said combustion barrel, said louvers being disposed distal said mounting plate.

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7. **(Original)** The burner apparatus of Claim 1 wherein there are a plurality of burner assemblies mounted on said burner mounting plate.

8. **(Currently Amended)** The burner apparatus of Claim 7 wherein at least one of said assemblies is generally centrally located on said mounting plate and the other of said assemblies are mounted in surrounding relationship thereto said burner assemblies include a nozzle, and there is an igniter for igniting combustible fuel passing through said nozzle of at least one of said burner assemblies.

9. **(Original)** The burner apparatus of Claim 1 wherein said mounting plate has an opening providing open communication between said plenum and said burner barrel and said burner assembly comprises:

a burner tube in surrounding relationship to said opening; and
a nozzle disposed in said burner tube for introducing a combustible fuel into said burner barrel.

10. **(Original)** The burner apparatus of Claim 9 wherein said burner assembly further includes a burner vane disposed in said burner tube, said burner vane providing a series of radially extending, circumferentially spaced slots.

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11. **(Original)** The burner apparatus of Claim 10 wherein said slots are configured to impart a rotational pattern to air passing through said burner vane.

12. **(Original)** The burner apparatus of Claim 10 wherein said nozzle is disposed centrally of said burner vane.

13. **(Original)** The burner apparatus of Claim 9 wherein there is an igniter for igniting a combustible mixture passing through said nozzle into said burner barrel.

14. **(Original)** The burner apparatus of Claim 8 wherein said mounting plate has a plurality of openings providing open communication between said plenum and said burner barrel and each of said burner assemblies comprises:

a burner assembly tube in surrounding relationship to said opening; and
style="padding-left: 40px;">a nozzle disposed in said burner tube for introducing a combustible fuel into said burner barrel.

15. **(Original)** The burner apparatus of Claim 14 wherein each of said burner assemblies further includes a burner assembly vane disposed in said burner assembly tube, said burner vane providing a series of radially extending, circumferentially spaced slots.

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16. **(Original)** The burner apparatus of Claim 15 wherein said slots are configured to impart a rotational pattern to air passing through said burner vane.

17. **(Original)** The burner apparatus of Claim 16 wherein said nozzle is disposed centrally in said burner vane.

18. **(Original)** The burner apparatus of Claim 8 wherein there is an igniter for igniting a combustible mixture passing through said nozzle in said burner assembly centrally located on said mounting plate.

19. **(Original)** The burner apparatus of any of Claim 8 or 18 wherein selected arrays of burner assemblies can be ignited.

20. **(Original)** A multiple burner assembly apparatus comprising:
a burner assembly mounting plate, said burner assembly mounting plate having a generally centrally located opening and a plurality of additional openings laterally spaced from said centrally located opening and generally equally spaced from said centrally located opening and each other;

a burner assembly disposed in each of said openings, each of said burner assemblies comprising:

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a burner assembly tube in surrounding relationship to said opening;
a nozzle disposed in said burner assembly tube for introducing a combustible
fuel and

a burner assembly vane disposed in said burner assembly tube, said vane
including a series of radially extending, circumferentially spaced slots.

21. **(Original)** The multiple burner assembly apparatus of Claim 20 wherein said
slots are configured to impart a rotational pattern to air passing through said burner
assembly vane.

22. **(Original)** The multiple burner assembly apparatus of Claim 20 wherein said
nozzle is disposed centrally in said burner assembly vane.

23. **(Original)** The multiple burner assembly apparatus of Claim 20 wherein there
is an igniter for igniting a combustible mixture passing through said nozzle in said burner
assembly generally centrally located on said mounting plate.

24. **(Currently Amended)** The multiple burner assembly apparatus of Claim 20
wherein said additional openings are arrayed in a generally circular pattern around said
centrally located opening.

25. **(Original)** The multiple burner assembly apparatus of Claim 24 wherein there are eight of said additional openings.

26. **(New)** a burner apparatus comprising:

a housing defining a chamber and having an air inlet;

a peripherally extending baffle disposed in said housing, a first peripherally extending flow passage being formed between said housing and said baffle, said first flow passage being in open communication with said air inlet;

a peripherally extending combustion liner disposed inwardly of said baffle, a second peripherally extending flow passage being formed between said liner and said baffle, said second flow passage being in open communication with said first passage;

a reversing diverter disposed in said chamber, said diverter being positioned to direct air flowing from said first flow passage into said second flow passage;

a burner assembly mounting plate disposed in said liner, said burner mounting plate having a first side and a second side, said mounting plate and said liner at least partially defining a burner barrel on the first side of said mounting plate;

at least one burner assembly mounted on said burner mounting plate; and

a plenum on the second side of said mounting plate, and being in open communication with said second flow passage, whereby air from said air inlet passes through said first and second flow passages before entering said plenum.

27. (New) a burner apparatus comprising:

a housing defining a chamber and having an air inlet;

a peripherally extending baffle disposed in said housing, a first peripherally extending flow passage being formed between said housing and said baffle, said first flow passage being in open communication with said air inlet;

a peripherally extending combustion liner disposed inwardly of said baffle, a second peripherally extending flow passage being formed between said liner and said baffle, said second flow passage being in open communication with said first passage;

a reversing diverter disposed in said chamber, said diverter being positioned to direct air flowing from said first flow passage into said second flow passage;

a burner assembly mounting plate disposed in said liner, said burner mounting plate having a first side and a second side, said mounting plate and said liner at least partially defining a burner barrel on the first side of said mounting plate;

at least one burner assembly mounted on said burner mounting plate; and

a plenum on the second side of said mounting plate, and being in open communication with said second flow passage whereby any air flowing into said plenum from said second flow passage is heated by combustion gases formed in said burner barrel prior to entering said plenum.

28. **(New)** The burner apparatus of any of Claims 26 or 27 wherein said baffle has at least one baffle perforation through said baffle providing open communication between said first flow passage and said second flow passage.

29. **(New)** The burner apparatus of Claim 28 wherein there are a plurality of said baffle perforations.

30. **(New)** The burner apparatus of any of Claims 26 or 27 wherein there is at least one liner perforation through said liner providing open communication between said second flow passage and said burner barrel.

31. **(New)** The burner apparatus of Claim 30 wherein there are a plurality of said liner perforations.

32. **(New)** The burner apparatus of any of Claims 26 or 27 wherein there are a plurality of peripherally disposed louvers providing open communication between said first flow passage and said combustion barrel, said louvers being disposed distal said mounting plate.

33. **(New)** The burner apparatus of any of Claims 26 or 27 wherein there are a

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plurality of burner assemblies mounted on said burner mounting plate.

34. **(New)** The burner apparatus of Claim 33 wherein at least one of said assemblies is generally centrally located on said mounting plate and the other of said assemblies are mounted in surrounding relationship thereto, said burner assemblies include a nozzle, and there is an igniter for igniting combustible fuel passing through said nozzle of at least one of said burner assemblies.

35. **(New)** The burner apparatus of any of Claims 26 or 27 wherein said mounting plate has an opening providing open communication between said plenum and said burner barrel and said burner assembly comprises:

a burner tube in surrounding relationship to said opening; and
style="padding-left: 40px;">a nozzle disposed in said burner tube for introducing a combustible fuel into said burner barrel.

36. **(New)** The burner apparatus of Claim 35 wherein said burner assembly further includes a burner vane disposed in said burner tube, said burner vane providing a series of radially extending, circumferentially spaced slots.

37. **(New)** The burner apparatus of Claim 36 wherein said slots are configured

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to impart a rotational pattern to air passing through said burner vane.

38. **(New)** The burner apparatus of Claim 36 wherein said nozzle is disposed centrally of said burner vane.

39. **(New)** The burner apparatus of Claim 35 wherein there is an igniter for igniting a combustible mixture passing through said nozzle into said burner barrel.

40. **(New)** The burner apparatus of Claim 34 wherein said mounting plate has a plurality of openings providing open communication between said plenum and said burner barrel and each of said burner assemblies comprises:

a burner assembly tube in surrounding relationship to said opening; and
style="padding-left: 40px;">a nozzle disposed in said burner tube for introducing a combustible fuel into said burner barrel.

41. **(New)** The burner apparatus of Claim 39 wherein each of said burner assemblies further includes a burner assembly vane disposed in said burner assembly tube, said burner vane providing a series of radially extending, circumferentially spaced slots.

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42. **(New)** The burner apparatus of Claim 41 wherein said slots are configured to impart a rotational pattern to air passing through said burner vane.

43. **(New)** The burner apparatus of Claim 42 wherein said nozzle is disposed centrally in said burner vane.

44. **(New)** The burner apparatus of Claim 34 wherein there is an igniter for igniting a combustible mixture passing through said nozzle in said burner assembly centrally located on said mounting plate.

45. **(New)** The burner apparatus of Claim 44 wherein selected arrays of burner assemblies can be ignited.